



U.S. ARMY CHEMICAL MATERIALS AGENCY

Lewisite chlorovinyldichloroarsine

Military designations: M-1, M1 or L

Description: Lewisite, an organoarsenical blister agent, is a colorless, oily liquid when pure; however, the presence of impurities may result in an amber to dark brown coloration. Although lewisite does not evaporate readily, it may pose both a liquid contact hazard and a vapor hazard to the eyes, skin or respiratory tract, particularly at temperatures above its freezing point of 0.04 F. Lewisite has the odor of geraniums, and its vapor is approximately 7.15 times heavier than air.

Non-military uses: This compound has no known industrial or medical uses.

Military use: Lewisite was first synthesized in the laboratory during World War I at the former Camp American University in Washington, D.C., as an alternative blister agent to sulfur mustard. A lewisite production facility was built in Willoughby, Ohio. A ship loaded with 150 tons of lewisite was on its way to Europe when the World War I armistice was signed. Although the United States, Union of Soviet Socialist Republics, and Japan all had large stockpiles of lewisite between World War I and World War II, only Japan used lewisite. Lewisite was previously used as a weapon in projectiles, mortars and bombs, and it may be dispersed as a vapor, aerosol or liquid droplets.

Health effects: High concentrations of lewisite vapor may cause irritation and inflammation of the eyes, nose, throat, skin and respiratory tract. Unlike sulfur mustard, the first signs or symptoms of lewisite exposure occur within seconds to minutes

following exposure. The eyes may become gritty, with itching or burning, followed by reddening of the conjunctivae, swelling of the eyelids and difficulty keeping the eyes open in bright light. The skin may redden, with stinging pain, burning or itching within 30 minutes of exposure to liquid droplets. Skin blistering can occur up to 12 hours after exposure. The respiratory tract effects may include sneezing, hoarseness, coughing, and difficulty breathing. Lewisite may be absorbed into the bloodstream causing systemic toxic effects such as the lewisite shock syndrome which causes dramatic drops in blood pressure and "dry land drowning" in the lungs. Human exposure data suggest that acute lung damage from lewisite exposure may result in the development of chronic bronchitis, asthma, emphysema and recurrent pneumonias. Some evidence suggests that chronic lewisite exposure may cause cancer. However, there is no evidence to link lewisite exposure to the occurrence of adverse developmental effects in the unborn fetus.

Environmental fate: Because of their chemical and physical properties, lewisite and lewisite oxide will not remain as contaminants and are more likely to be soluble inorganic arsenic compounds. Lewisite persistence in soil is dependent upon temperature, pH, soil type and other factors. Under certain conditions, when protected from environmental degradation processes, lewisite and/or lewisite oxide could persist in soil for decades.

For more information,
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